

The LongPath

A North Alabama DX Club Publication

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From the President

We have finally made it to contest season, which starts out with the CQWW DX RTTY version. I get pretty rusty in the off-season, but the magic of RTTY contesting gets my juices flowing. So I took some time to do the maintenance on my antennas, and especially to reorganize my station. I'm a stickler for detail in how I have my equipment arranged. I know I can always do better, as well all do. As I look at the arrangement today, I can't believe how poorly I had done this in the past dozen or so times I had rearranged it all. And I'm always looking to see how other hams have done it better. Now I can reach every single knob or switch I need without extending my arms; I barely have to turn my head to see all the displays; the meters are all together; and the antenna controls are all grouped together. Now I'm focused on the next reorg.

I'm badly starved for a hamfest at this point, so I decided to start including For Sale ads in the Long Path. I understand less than a few ads have been received at this point. So I included my own. I have some previously-loved equipment that is looking for new homes. Some of it may even be free. I hope others will pick up on this opportunity to have micro-hamfests.

These days I strangely have more time to devote to tech projects for myself and others. I have had the delight of working with Steve, AG4W, on

his never-ending list of ham upgrades. I hope you have read his Long Path articles closely. He has attempted so many huge projects over the last year. A 2m, 2KW FET amp for moon-bounce, complete with metal work and firmware, and now it is even more RF and audibly quiet, and his 2m country count is going through the roof! A 6m, 900 watt amp using a pair of 3-500G's (these are the newer tubes) and a SB220 carcass. If you want to learn really difficult RF design, then start at VHF.

I've been stewing over a design problem myself. I'd like to operate my station remote, and use my rig and antennas from locations away from home. The problem is seemingly simple. How do I ground a pin on the rig to turn it on remotely. Surely there are components made to run over the internet, through my router, then my WiFi. Ideas??

We'll have some discussion items at our meeting on Tuesday. Fred, KF3FRK and Susan, AI4VV, will announce their selection of a slate of officers for next year. We'll vote at the November meeting. We have cancelled all group activities since the covid problem hit us, and of course it is really starting to hurt. No more restaurant meetings. No Huntsville Ham-

Cont'd on p. 7

How to Join

- * Come to a club meeting;
- * or send in an application by mail (form on www.NADXC.org)

HF Receive Antennas

October Program by Bruce Smith, AC4G

Those who've been to AC4G's farm have seen the real estate required for a popular receiving antenna, the Beverage. Is the real estate occupied and effort required to erect the antenna worth the results? How about other low-band receive antennas? Join in on this discussion, led by Bruce. Look for the program to begin around 7:30.



Retirement and COVID Project Update 6

By Steve Werner, AG4W

My favorite contest of the year is the CQWW RTTY contest. Last year I was really happy and lucky to win the US for single operator high power all band. This year my wife entered the hospital the Tuesday before the contest and stayed for 9 days. Contesting prepares you for many things you don't expect. I stayed with her the first 60 hours continuously after she was first admitted to the ER. I bet there are not that many people that have the ability to do that much seat time without contesting experience. COVID has sure made hospital stays difficult with limited visitors and lots of rules. I am happy to get her home to rest and get better.

The weekend before the CQWW RTTY contest I decided to enter the ARI Italian EME contest. The best moon bounce propagation in September was on the Tuesday to Thursday before the contest. This month I made contacts with 17 new EME stations I have not worked before, 3 of which were during the contest bringing my unique station total to 171. Most of the stations I worked during the contest had 4 or more yagis since propagation was not great. Working 17 stations in 2 days takes patience. I worked 12 the first day and 5 the second day. This was a nice warm up for the ARRL EME contest which is held October 10 and 11. That contest also has a second weekend at the end of November. This year it is the same weekend as CQWW CW. It will be a tough decision to decide which to enter. I expect the EME contest this weekend will be very difficult due to Hurricane Delta which will impact both nights.

I continue to make progress with improving my 2 Meter amplifier. This month I added two ferrites to the output of the DC power supplies. I used my NanoVNA to look at the frequency range of my unmarked ferrites. There is

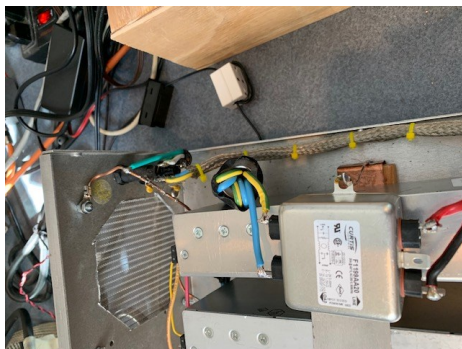


NanoVNA inspecting ferrite filters

much less noise on the DC output than problems I had with the AC input to the power supplies. I used a commercial filter and ferrites on the input.

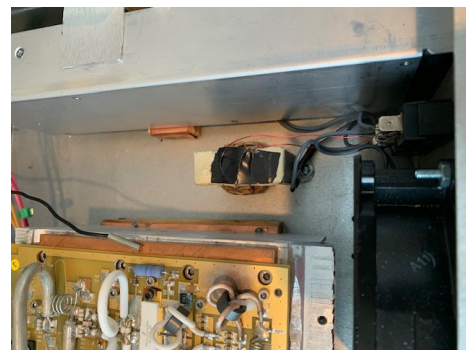


Above: Ferrites on power supply output.
Below: Commercial filters on the input



I also installed an inductor in series with the 120VAC fans for the amplifier this month so I could switch the inductor into the line to reduce the speed of the fans. I started out trying to wind a toroid but it did not have the right response for 60Hz. I then looked at some of the power transformers I had and decided to take windings off the secondary of one of them to get to the right inductance. The advantage of using an inductor instead of a resistor is

you won't have the power dissipation. I now have a switched two speed fan.



Series inductor to reduce fan speed

I also did more maintenance work on the antennas this month. Be sure and check rope tension and old tie wraps. With the expected bad storms in the fall and winter it is much easier to do that work now. I also had to reinforce a wooden support that had numerous carpenter bee holes. They have become a real problem in our area. I have 3 carpenter bee traps that help some.

This month I started working part time again. I don't plan work to conflict with my ham projects or contesting. It does help keep my mind challenged and almost all of the work can be done from home. It is amazing how much engineering work in Huntsville is being done from home.

73 Steve AG4W

The LongPath Staff

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Chris Reed, AI4U, Minutes

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Kevin Hibbs, KG4TEI, The Casual DXer

Adding a PANADAPTOR to HF Rigs

By Bruce Smith, AC4G

There are raving reviews on the new and latest HF transceivers recently entering the amateur radio arena. One of the features that is highly sought after with the new rigs is having panadaptors. Since I cannot afford a new rig, I decided to add a panadaptor to my rig. My rig is a Yaesu FTdx3000 with a bandscope, but the bandscope is inadequate for my needs (see Picture 1 below). Researching the internet will yield many articles on SDR receivers and panadaptors. In this article, we will discuss the definition of a panadaptor and what it can do for hams especially DXers & contesters; hardware required to add a panadaptor to my Yaesu FTDX3000; the software used to control the hardware of the panadaptor; and a few conclusions.



Picture 1: Small “bandscope” on AC4G’s Yaesu FTDX3000

Picture 1 shows the transceiver’s panadaptor not meeting AC4G needs

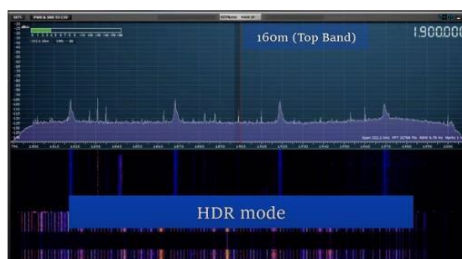
Panadaptor is short for “panoramic adapter”. It was developed around WWII era. Some call it a “bandscope” which is the popular buzz word today. The panadaptor has the function of spectrum scope or spectrum analyzer. This is similar to an oscilloscope, but like the spectrum analyzer does displays signals in frequency domain instead of time domain. It helps to be familiar with Fast Fourier Transform or “FFT” referring to an algorithm that converts time domain data to the frequency domain.

The panadaptor allows ham operators to see all radio stations transmitting across an entire radio band at a glance and almost instantly find signals

without tuning the transceiver’s VFO. Why is this important? In a pileup is allows a DXer to quickly find an open, clear frequency almost instantly to transmit and make that highly sought after, needed QSO to add to their DXCC total. How many times have you been in a pileup and quickly find a clear frequency to transmit? It also allows the radio amateur to operate on one band while monitoring signals on another; analyze received signals on the bands i.e. splatter, bandwidth, distortion, other noise, RFI, etc.; and check their transmitted signals for spurious emissions, distortion, splatter, etc.

The panadaptor is useful since it allows you to quickly find a clear frequency in a DX pileup or in a major crowded contest such as CQWW DX CW contest. Modern 2019-2020 software defined radios have this feature built-in such as the FLEX, Elecraft, and other major brands. Older ham transceivers such as Yaesu FTDX3000 (marketed in ~2015) were built with a panadaptor; however for my use, the display is not useful and when adjusted does not have fidelity (high resolution) to separate stations. Our discussion will focus on enhancing AC4G’s Yaesu FTDX3000 with a better, more useful panadaptor (bandscope).

Modern panadaptors provide two features: (1) A “spectrum” display of a particular amateur band; and (2) a waterfall display. See Picture 2 below.



Picture 2: Panadaptor display showing spectrum and waterfall displays

The spectrum display shows real-time amplitude of a signal over a range of frequencies. The waterfall display show the same frequency range of signals overtime to include their history (Color is used to represent signal amplitude).

The block diagram below (Diagram1) shows the panadaptor configuration of a system using a Software Defined Radio (SDR) for the AC4G panadaptor system. The system consists of three major components: your HF transceiver, SDR, and a fast computer to process data fed by the SDR. Note that the SDR is useful for monitoring a band of frequencies and is totally separate from the station transceiver and its receiver.

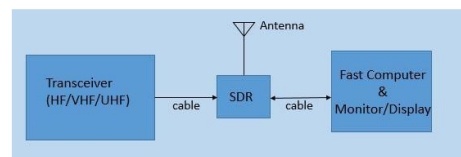


Diagram 1: Configuration of a basic panadaptor system

We mentioned SDR above, but we have not defined SDR. SDR is a radio communication system where components that have typically been implemented in hardware (e.g. mixers, filters, amplifiers, modulators/demodulators, detectors, etc.) are implemented by means of software on a personal computer or embedded system. [Reference Wikipedia]. A basic SDR system may contain a PC with sound card, analog/digital (A/D) converter, preceded by some form of RF front end. SDR attempts to put much of the complex signal handling in communications receivers and transmitters into the digital signal processing. A SDR Receiver may only consist of an A/D converter integrated circuit; antenna; and a PC performing filtering and signal detection.

Cont'd on p. 4

Adding a Panadaptor to HF Rigs

(cont'd from p. 3)

If one searches the internet, one will find many SDR's available for many uses. Many SDR are being sold by popular amateur radio supply out-stores for use for ham radio applications. Many SDR's researched and found are as follows: ColibriNANO; RTL SDR Dongle; Xiegu G90 Portable SDR; MFJ1708 SDR; SDRplay DUO; SDRplay RSPdx; SDRplay RSP1A; ELAD SDR; Ham It Up v1.3-NooElec RF Upconverter For SDR to name a few.

As I began my quest to add a panadaptor to my rig, I realized the need to be aware of transmitter isolation from the SDR. The SDR must be protected from damaging levels of RF. This can be accomplished with my rig by using either of the following ports on the back of the FTdx3000: Use an auxiliary receiver "RF OUT" or use the "IF OUT" connection from transceiver. For older rigs, one must connect their SDR to their antenna via RF Sensing T/R switch (Older HF rigs). The latter goes beyond the scope of this article.

Let us discuss the "PROs & CONS" of getting a signal for the SDR to receive from the following methods: signal input to SDR from antenna (Older HF rigs); signal input to SDR from rig's "IF OUT" (Yaesu FTdx3000); and signal input to SDR from rig's "RX OUT" (Yaesu FTdx3000).

Signal Input to SDR from Antenna

The advantages of tapping into the antenna to send the signal to the SDR input is that the bandwidth is only restricted by SDR. It also may be synched with or tuned independently of transceiver. However, the drawback is protection from the transceiver is required. One must come up with a method to synch the SDR to the transceiver, one may have to utilize "Clock" or "Synch" or "Ref In" to prevent damage from transmitting into the SDR.

Signal Input to SDR from Transceiver "IF"

Perhaps a better approach to get a signal from the transceiver to the SDR may be via the transceiver "IF OUT" RCA adaptor in the back of the transceiver. Overload damage is likely not an issue. SDR tuning is set to IF frequency and is in synch with transceiver. However, SDR bandwidth is limited by transceiver IF. IF bandwidth may not be flat. Modifications may be required on any transceiver that does not have an "IF OUT" port. An isolation amp may be needed to eliminate any concern or damage to the transceiver. Another disadvantage is that Point-n-Click tuning of transceiver may not be available from "bandscope" display.

Signal Input to SDR from Transceiver "RX OUT" (Reference Picture 3)

For AC4G's project, the best approach for obtaining a signal from the transceiver to the SDR is via the "RX OUT" RCA adaptor on the rear of the Yaesu FTdx3000. Overload damage likely not an issue and SDR tuning is across entire band and is in synch with transceiver. The only disadvantages is that the SDR bandwidth is not limited by transceiver IF as in previous scenario, but modifications may be required on some transceivers (if no port). Point-n-Click tuning of transceiver is most likely available from "bandscope" display.



Picture 3: Rear of AC4G's rig exposing "RX OUT" port

HARDWARE

A discussed earlier, a fast desktop or laptop computer is needed. Some SDR software/hardware may require more computing horsepower than others. The PC needs to have "fast" processor to manage the data and display to/from the SDR. The AC4G solution is configured as shown in Picture 4 utilizing a computer, transceiver, and SDR. AC4G is making use of SDRPlay RSPdx software defined receiver (Picture 5).



Picture 4: AC4G Panadaptor configuration

1KHz - 200MHz
BNC Port



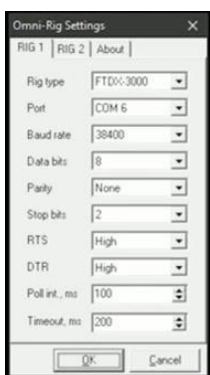
Picture 5: SDRPlay RSPdx Receiver

The AC4G configuration will utilize the "RX OUT" RCA jack on the back side of the Yaesu FTdx3000. This jack provides the output of the receiver lines from the antenna jack allowing full band displaying. The "IF OUT" RCA jack outputs the FTdx3000's receiver 9 MHz 1st "IF" signal not passing through the roofing filter(s). The "IF OUT" RCA jack limits display only to "IF" frequencies. The "Ant C" port on the SDRPlay will connect to the FTdx3000's "RX OUT" RCA jack via a 50 Ohm BNC cable. The SDRPlay connects to the PC via the USB cable (Reference Picture 4). Diagram 2 on the next page shows the FTdx3000 Front end block diagram and where the SDR input is taken for either the "RF OUT" and "IF OUT" jacks.

Cont'd on p. 5

SOFTWARE

Obviously, software is required to operate this panadaptor for AC4G's configuration. Software setup is fairly simple and straightforward, just follow the simple instructions. OmniRig is a software tool that control a communications interface(s) for CAT control. OmniRig can be configured to interface 2 different rigs. The software is free and available for download at <http://www.dxatlas.com/Omnirig>. The configuration settings for OmniRig can be seen in Picture 6.



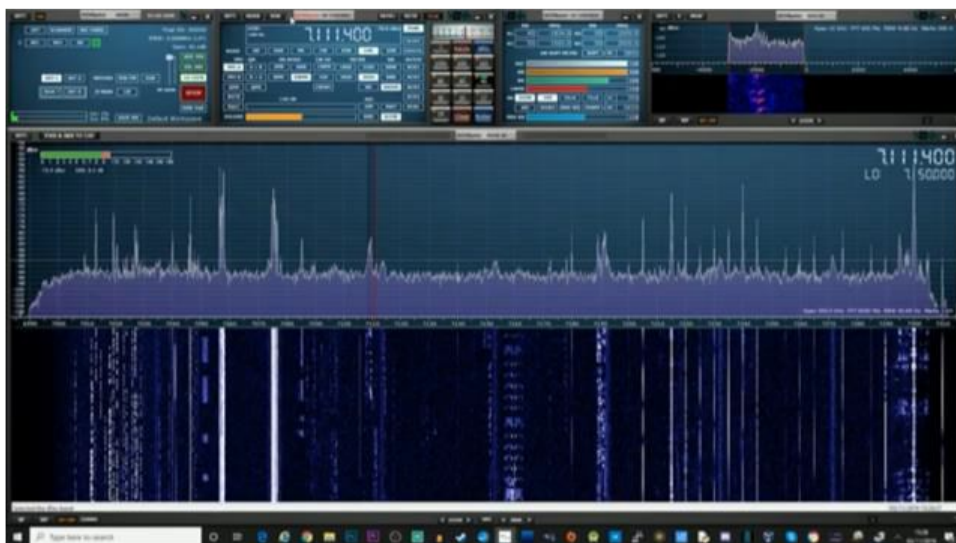
Picture 6:
Omni-Rig settings
for Yaesu
FTdx3000

Another software tool to be used is SDR Uno by SDRplay. It does all of the processing for the input/output (I/O) and/or digital stream from SDR. It also displays the results of the monitor. This software allows one to jump to a frequency or bandwidth the click of a mouse. The fidelity of the display increased tremendously allowing fine details to be seen. When transmitting, the display behaves similar to the display of WSJT FT8 in that the display/waterfall stops and continues to re-

ceive more data when transmissions have ended. This software is available for download with SDRPLAY at www.sdrplay.com.

Finally, the working panadaptor of Picture 7 below shows the "spectrum" display of a particular amateur band and the "waterfall" display. All (and Older) HF transceivers can benefit from an add-on panadaptor. Software Defined Radios can be obtained easily with remarkable specifications to aid in any panadaptor project. The approach is easy and cost effective to add SDR to HF transceiver for a panadaptor. The DX'er, contest, and casual ham can

all benefit and allows the ham operator to quickly find an open frequency to operate using a "Panadaptor" without losing any time tuning the transceiver's VFO. Was it worth the time and energy for me to do this project? You bet! I would do it again in a heartbeat to reap the benefit for finding a clear frequency in a contest or finding a clear frequency quickly in a huge DX pileup. 73! See you in the pileups! Trust this information will help you with your panadaptor addition. - AC4G -



Picture 7: Working SDRPlay-based Panadaptor Display

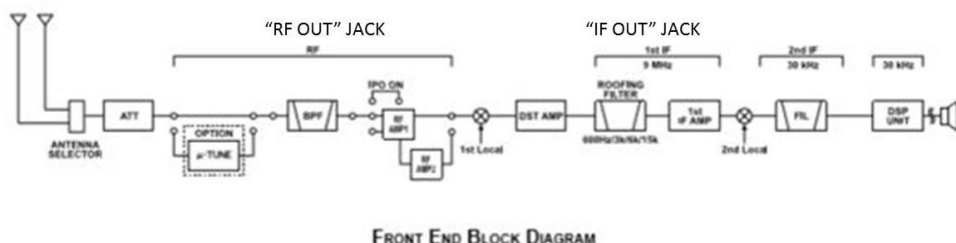


Diagram 2: FTdx3000 Front End

NADXC Officers and Directors

President	Bob De Pierre, K8KI
Vice President	Steve Molo, KI4KWR
Secretary/	Chris Reed, AI4U
Treasurer	
At-large	Kevin Hibbs, KG4TEI
Directors	Tom Duncan, KG4CUY
(Ex-Officio)	Steve Werner, AG4W

Nominating Committee Report

The NADXC Nominating Committee puts forward the following slate of candidates for consideration in the upcoming election of officers and directors for 2021.

President — Bob DePierre K8KI
Vice President — Steve Molo KI4KWR
Secretary/Treasurer — Chris Reed AI4U
Director — Tom Duncan KG4CUY
Director — Kevin Hibbs KG4TEI

Susan Seaford, AI4VV and
Fred Kepner, KF3FRK
NADXC Nominating Committee

LongPath Advertising Policy

NADXC welcomes advertisements for ham equipment in the Long Path newsletter each month. Private sales are free to regular members, not to exceed 20 lines and a small photo. A private sale is for a single edition of the Long Path, and may be extended up to six months. For individuals who are not regular members, a single ad is available for \$5, with the same limitations. Commercial advertisements are accepted at a price of \$20 for half-page entries only. NADXC unconditionally reserves the right to reject any advertisement.

New License Plates

By Barry Johnson, W4WB

I recently received my new amateur radio tag. There are some interesting differences from the prior tag. Notice that the symbol on the left side now appears to be the ARRL logo without the A R R L on it. EMERGENCY COMMUNICATIONS at the bottom has a much larger font so that it now can be seen. Under ALABAMA, there is a Morse code message and under EMERGENCY COMMUNICATIONS there is additional Morse code message.



Can you interpret the *meaning* of the Morse code messages? The best answer will win a prize from my collection of ham radio stuff. You can get bonus points if you can interpret the meaning of the waveform and state the meaning of the symbol on the left side. Saying who ever designed this tag was QLF isn't an answer. hi hi

Send your entries to either Bob K8KI or me. Winner will be announced at the October NADXC meeting.



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Treasurer's Report

Balance as of September 30:

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Paypal Balance

\$ 154.44



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For Sale

By Bob DePierre, K8KI

From the Rick Rice estate, any proceeds going to his daughter:

- KWM-2 and PS (being stored now by N4KH)
- HRO-500
- NCX-5, PS, and remote VFO

Other K8KI stuff:

- Alpha 91B amplifier
- Alpha 9500 with two extra 8877 tubes
- a few bench ammeters
- Heathkit IM-2420 counter
- MFJ-259 antenna analyzer
- TenTec Pegasus
- MFJ-704 LPF
- variable attenuators
- HP 6202B power supply
- Astron 35A power supply
- HP 8657 signal generator
- Heathkit SB-104 transceiver (nice shape but needs some TLC first)
- Entire run of Ham Radio Magazine, 1967-1991, printed, in volumes.
- Palomar tuner tuner (that's right)
- a few speakers

My prices are all negotiable. All are looking for good homes. A few might even be free. Drop me a line if you have any interest.

September Meeting Minutes

By Chris Reed, AI4U, NADXC Secretary/Treasurer

Bob K8KI called the virtual meeting of the North Alabama DX Club to order on Zoom on Tuesday September 8, 2020 at 7pm. Thirty-one joined in on the virtual meeting. Bob, K8KI welcomed everyone. Bob spoke about the new emeritus membership. The NADXC has several members that have contributed to the club in an extraordinary way. The following were nominated as emeritus members:

- Tom Duncan, KG4CUY made a motion to nominate Craig Behrens, NM4T.
- Mark Brown, N4BCD nominated Bill Bathgate. Mark shared these words regarding Bill's contribution to both NADXC and HARC, "Bill Bathgate KD8IGK served as a NADXC officer for three years, as Vice President in 2013 and then as Secretary / Treasurer in 2014 & 2015. Bill's term in 2015 was cut short when he stepped down to run for President of the Huntsville Amateur Radio Club (HARC) but during his tenure Bill implemented online payment for dues and DX Banquet ticket sales. The online Banquet sales started a significant upward trend in attendance from the mid-50's range to the near 100 attendee range we enjoy today. Bill's election to the HARC presidency coincided with an effort by some HARC members to start a new club by seizing its physical and financial assets. Bill fought this vigorously by marshaling resources to have a successful Field Day using alternate towers and then filing a lawsuit for return ownership of the club's property. Bill moved to Michigan in 2016 while continuing to spend a great deal of effort and money to finally achieve a favorable court outcome of the return of HARC's name and property to its

rightful owners. I hereby nominate Bill Bathgate KD8IGK to emeritus status in the North Alabama DX Club."

- Bruce Smith, AC4G nominated Bill Christian, KI4KR SK. Bill began his ham career in the 1950s. He was an ARRL life member, and attended almost all NADXC and HARC meetings for many consecutive years. A founding member of both clubs, Bill served as NADXC president in 1967, 1968, and 1976.
- John Morris, K4XH and Nancy Morris, K4JD were nominated for their service to NADXC and the amateur radio community. Both were charter members of NADXC and both served terms as president.
- Tom Russell, N4KG was nominated for his service to the North Alabama ham community. Always available as a mentor, Tom was a top-notch DXer and known to DXers the world over.

Bob, K8KI made a few more announcements, then meeting was adjourned for the program. Jim Spikes, N4KH presented the program on "Bletchley Park". The next virtual meeting is scheduled for 7 p.m. Tuesday, October 13th on Zoom. Information will be sent prior to the meeting.

Respectfully submitted,

Chris, AI4U

DX Contests for October

By Chuck Lewis, N4NM

UBA ON Contest, CW, (CW), 80 Meters

Oct. 11, 0530Z to 0800Z

Exchange: RST, serial No., ON section (if any)

See page 69, Oct. QST and

www.uba.ba/en

Oceania DX Phone Contest (CW), 160-10 meters

Oct 10, 0800Z to Oct 11, 0800Z

Exchange: RS & Serial No.

See page 69, Oct. QST and

www.oceaniadxcontest.com

Scandinavian Activity Contest, (SSB) 80-10 meters

Oct. 10, 1200Z to Oct. 11, 1200Z

Exchange: RS & Serial No.

See page 69, Oct. QST and [http://](http://www.sactest.net)

www.sactest.net

JARTS WW RTTY Contest, (RTTY), 80-10 meters

Oct. 17, 0000Z to Oct. 18, 2400Z

Exchange: RS(T) & op's age

See page 69, Oct. QST and

www.jarts.jp/rules2020.html

Worked All Germany Contest, (SSB & CW), 20-10 meters

Oct 17, 1500Z to Oct 18, 1459Z

Exchange: RS(T) plus serial number or DOK code

See page 69, Oct. QST and

www.darc.de

Stew Perry Topband Challenge, (CW), 160 meters

Oct. 17, 1500Z to Oct. 18, 1500Z

Exchange: 4-character grid square

See page 69, Oct. QST and

www.kkn.net/stew

Asia-Pacific Fall Sprint, (CW), 15 & 20 meters

Oct. 18, 0000Z-0200Z,

Exchange: RST plus serial number

See page 69, Oct QST and

www.jsfc.org/apsprint

CQ WW SSB, (SSB), 160-10 meters

Oct. 24, 0000Z to Oct 25, 2359Z

Exchange: RS & CQ zone

See page 69, Oct. QST and

www.cqww.com/rules.htm



Dates & times often change or are misprinted in the journals; beware. Also, check the cluster: "sh/contest". Have fun!

Chuck, N4NM

From the President

(cont'd from p. 1)

fest. No Dayton. No club picnic. This is really starting to drag. Next up is the annual Christmas Party in December. We need to discuss whether we should have the party at a restaurant, and how and whether we can do it safely. At the next meeting I would like to discuss it all, and then ask you whether you are in favor of it, and whether you would attend. Please think of it now. What is the right thing to do?

The program this month is from another of our big contributors, Bruce,

AC4G. Not only did he write a good article for our newsletter, but he will also present a talk on the comparison of various HF receive antennas. I thought this was easy until I tried it myself. Receive-only antennas are not designed like the simpler transmit/receive antennas, and you need radios that will work with them. I sure hope he likes the receive antenna that I use here. So come join us for another covid-free virtual meeting of the NADXC on Tuesday, October 13. We'll use Zoom again. I'll send you another invitation, but the sign-on will be exactly the same. I'll

open Zoom for informal discussion at 6:30, and start the meeting at 7pm.

73 de Bob, K8KI